# CLAIMS

1. In an intermediate network device having a plurality of ports for forwarding network messages within a bridged network, a method for preventing the formation of loops within the bridged network, the method comprising the steps of:

executing a spanning tree protocol (STP) at the intermediate network device so as to elect a root of the bridged network and to transition at least one of the device's ports among a plurality of spanning tree port states, including a discarding state, a listening state and a forwarding state;

periodically receiving configuration bridge protocol data unit (BPDU) messages at one or more of the device's ports;

in response to the periodic receipt of BPDU messages being stopped on a given port, (1) preventing the given port from transitioning to the forwarding spanning tree port state, if the given port is in a spanning tree port state other than the forwarding spanning tree port state, or (2) precluding the given port from forwarding or receiving network messages, if the given port is in the forwarding spanning tree port state.

2. The method of claim 1 wherein the spanning tree port states further include a loop inconsistent spanning tree port state, and the method further comprises the step of placing the given port that stopped receiving BPDU messages in the loop inconsistent spanning tree port state.

3. The method of claim 2 wherein a port in the loop inconsistent state is precluded from transitioning to another spanning tree port state and from forwarding or receiving network messages.

4. The method of claim 2 further comprising the steps of:

releasing the given port from the loop inconsistent spanning tree port state, in response to a BPDU message once again being received on the given port; and

transitioning the given port from the loop inconsistent spanning tree port state to another spanning tree port state.

5. The method of claim 4 further comprising the steps of:

storing BPDU information from BPDU messages periodically received on a first port;

resetting a message age timer upon receipt of each BPDU message at the first port; and

if the message age timer reaches a maximum age value before another BPDU message is received on the first port, discarding the stored BPDU information.

6. The method of claim 5 wherein the given port is considered to have stopped receiving BPDU messages when its message age timer reaches the maximum age value and/or its received information while timer reaches zero.

7. The method of claim 6 wherein the ability to place ports in the loop inconsistent state is enabled and disabled on a port-by-port basis.

8. The method of claim 6 further comprising the steps of assigning or more ports to a role, the roles including one or more of a Root Port Role, an Alternate Port Role, a Designated Port Role and a Backup Port Role.

9. The method of claim 5 wherein the STP substantially complies with at least one of the IEEE 802.1D, 802.1w and 802.1s specification standards.

10. An intermediate network device configured to receive and forward network messages within a bridged network, the device having a plurality of ports for connecting the device to one or more network entities or other devices, the intermediate network device comprising:

a spanning tree protocol (STP) engine configured and arranged to elect a root of the bridged network and to transition at least some of the device's ports among a plurality of spanning tree port states, including a discarding or blocking state, a listening state and a forwarding state; and

9        a loop guard engine cooperating with the STP engine, wherein

10            configuration bridge protocol data unit (BPDU) messages are periodically

11        received at one or more of the device's ports, and

12            in response to the periodic receipt of BPDU messages being stopped on a

13        given port, the loop guard engine (1) prevents the given port from transitioning to

14        the forwarding spanning tree port state, if the given port is in a spanning tree port

15        state other than the forwarding spanning tree port state, or (2) precludes the given

16        port from forwarding or receiving network messages.

1        11. The intermediate network device of claim 10 wherein the spanning tree port

2     states further include a loop inconsistent spanning tree port state, and the loop guard en-

3     gine causes the given port that stopped receiving BPDU messages to be transitioned to

4     the loop inconsistent spanning tree port state.

1        12. The intermediate network device of claim 11 wherein

2        the spanning tree port states further include a loop inconsistent spanning tree port

3     state, and

4        the loop guard engine causes the given port that stopped receiving BPDU mes-

5     sages to be transitioned to the loop inconsistent spanning tree port state.

1        13. The intermediate network device of claim 12 wherein

2        the loop guard engine causes the given port to be released from the loop inconsis-

3     tent spanning tree port state, in response to a BPDU message once again being received

4     on the given port, and

5        upon being released from the loop inconsistent spanning tree port state, the STP

6     engine transitions the given port to another spanning tree port state.

1        14. The intermediate network device of claim 13 further comprising a message

2     age time associated with a first port, wherein

3        the STP engine stores BPDU information from BPDU messages periodically re-

4     ceived on the first port,

5  restarts the message age timer upon receipt of each BPDU message at the first

6  port,

7  if the message age timer reaches a maximum age value before another BPDU

8  message is received on the first port, the STP engine discards the stored BPDU informa-

9  tion, and

10  the first port is considered to have stopped receiving BPDU messages and is tran-

11  sitioned to the loop inconsistent state when its message age timer reaches the maximum

12  age value.

1  15. The intermediate network device of claim 10 wherein the given port is kept in

2  a blocking state to preclude the given port from forwarding or receiving network mes-

3  sages.